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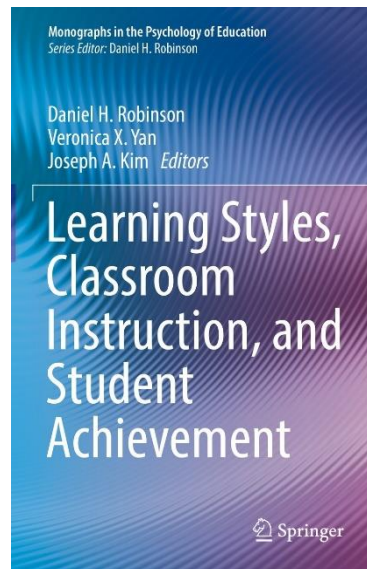
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Daniel Robinson, Veronica Yan, and Joseph Kim barrel full speed ahead into the longstanding debate around the concept of learning styles and the perpetuation of neuromyths—misconceptions about the brain—in their new book *Learning Styles, Classroom Instruction, and Student Achievement*. Learning styles are continually justified by misunderstanding Howard Gardner’s theory of multiple intelligences. Gardner has gone on record to argue that the learning styles theory is an illegitimate offshoot of his theory, stating “If people want to talk about ‘an impulsive style’ or ‘a visual learner,’ that’s their prerogative. But they should recognize that these labels may be unhelpful, at best, and ill-conceived at worst” (Strauss, 2013) However, the idea of learning styles fits well with individualizing and customizing education methods. Unfortunately, the concept of learning styles sounds right and is thus presented as a vital pedagogical tool for educators. Hence, it is not going away any time soon.



More than half, 29, of the states in the United States and Washington, DC, require educators in training to be assessed on the use of learning styles to pass certification examinations (Furey, 2020.) Endless professional development efforts are created that train educators how to differentiate material based on learning styles. However, scientific backing has not been found for the employment of learning styles. Anti-learning-style advocates have produced many articles in peer-reviewed journals for nearly a decade,

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but the popularity of learning styles in education has only increased. Currently a divide exists between research-based educationists and those in education who have misinterpreted neuro-education based on the bias to prefer scientifically sounding arguments.

*Learning Styles, Classroom Instruction, and Student Achievement* is the first monograph in a series focusing on the psychology of education from the publisher Springer. The forcefulness of the authors' arguments are supported by their expertise: Dan Robinson is currently the Associate Dean of Research at The University of Texas at Arlington following a three-year term as Chair of the Department of Curriculum and Instruction; Veronica Yan is an Assistant Professor at the University of Texas at Austin; and Joseph Kim is a Professor at McMaster University in Canada in the Department of Psychology, Neuroscience, and Behaviour.

The editors and authors are not pulling any punches with their perspectives on learning styles and present thoroughly supported arguments for the mistrust of same. The books opening chapters provide a clear indication of their stances: "self-report tests that claim to assess one's learning style are simply entertaining for students," and "Persons who resonate with these snake oil treatments [learning styles] are similar to those who watch late-night infomercials explaining to them that being overweight is not their fault" (p. 7). The overall tenor of the book is more palatable for those educators, administrators, or parents already opposing the implementation of learning styles as a cure-all for struggling students. However, the book provides a more nuanced look into the debate and demonstrates other underpinnings for those inclined to fight against such neuromyths.

The editors created a theme approach to their assessment and denunciation of learning styles, an idea first conceptualized in the 1960s in response to the New York State Education Department's concern for poorly achieving students. This context helps readers to find their footing in the larger dialogical discourse, which continually vexes educational researchers, especially those in educational psychology, such as Yan and Kim. The continued frustration for educational psychologists and researchers stems from the idea that learning styles go against all research and data-supported learning theories. Mobilization of learning styles is a perfect example of an *idée fixe* that creates barriers to student learning and growth rather than a growth mindset, as supported by Carol Dweck. Educationists currently live with a paradox: a fixed mindset theory of learning styles and a contradictory belief in the growth mindset.

The authors delve deeply into the quandary of how a neuromyth repeatedly repudiated by researchers has survived and thrived into what the authors call a zombie concept. The main thrust of the volume is identifying why learning styles are so prevalent, especially in the K-12 sector of education, and how this perseverance is leading to debilitating issues for students. Students begin to believe they can only learn when their learning

style matches the teacher's pedagogical style. As such, lack of learning is now entirely out of the learner's hands. As the authors note, "This kind of restrictive, deterministic thinking gives rise to another concern: the possibility of self-handicapping and pigeon-holing based on one's supposed style" (p. 62). The authors describe the application of learning styles as creating fixed mindsets, which not only affect the student's ability to grow but may also alter educators' perceptions of student abilities. Overreliance on learning styles also places unnecessary restrictions on students and limits their ability to flourish in multiple modalities. For example, students who believe they are solely kinesthetic learners could disengage during parts of lessons that require reading and writing. Likewise, learners who are "diagnosed" as being auditory may not interact with the visual aspects of a given lesson. Rather than connecting learning to all senses of a student, which is supported by research, learning styles provide excuses for disengagement and learned helplessness.

The most substantial element in *Learning Styles, Classroom Instruction, and Student Achievement* focuses on how the learning styles neuromyth has remained sustainable and ways to counteract its preservation. The authors emphasize that the idea behind learning styles is attractive not only to K-12 educators but also to parents and broader society, students, K-12, teacher trainees, researchers, ministries, or large school districts and education departments. According to the authors, each entity does not come upon learning styles organically but is introduced to the topic. The book goes through a particularly thorough analysis of how the concept is propagated across academia.

One of the most insightful investigations in the book deals with how learning styles are dispersed through peer-reviewed journals. Peer-reviewed journals are traditionally considered of the utmost academic rigor, supported by a network of critical and inquisitive academics. Nevertheless, the authors demonstrate how peer-reviewed journals are not skeptical about the lack of supporting research for learning styles. For example, the *International Journal of Technology and Design* published an article by Emani, Bazzocchi, and Hakima (2019) stating that "students whose preferred learning styles align with the assessment themes showed better performance in the course," which was purely correlational (p. 22). A 2019 article by Chetty, Handayani, Sahabudin, Ali, Hamzah, Rahman, and Kasim in the *International Journal of Evaluation and Research in Education* suggested that "Individuals learn in different ways using several learning styles, but lecturers may not always share material and learning experiences that match students' learning preferences" (p. 22). As the authors note, Kirschner (2017) points out that educational researchers must protect their credibility by not relying on simplistic correlation and work to benefit and protect all educators. The authors also argue that the push to deconstruct the myth of learning styles has ironically led to a 35% increase in published articles on the subject (p. 47). Identifying academic journals as one of the most prominent myth-spreading agents should be a wake-up call to all educators involved in scholarly pursuits.

In addition to academic journals, the concept of learning styles is supported and perpetuated through other channels, such as the media and non-experts, and commercial enterprises, such as brain-training, learning style assessments, workshops, conferences, and books and teaching guides, academic centers and university libraries, teacher colleges, and psychology and education textbooks. There is also a trickle-down effect within the education profession as the concept goes from teacher preparation programs to novice teachers who become administrators to in-building professional development for faculty that is then pushed to all K-12 students. The web of sources perpetuating the neuromyth is embedded in the education system and sustained through a [I don't see anything "cyclical" about this "dynamic." Perhaps domino effect or trickle-down effect?] dynamic of schools of education training educators about learning styles who then take them to the classrooms and spread them to students in perpetuity.

Awareness of the transmission and sustainability of the learning styles myth is essential for all K-12 educators and teacher educators. It is important to note that this neuromyth stands despite research in neuroscience highlighting its weaknesses. Neuroeducation, a hybrid research field that combines the tenets of neuroscience with education, currently needs to be more widely understood. Howard-Jones (2014) argued that "Cultural conditions, such as differences in terminology and language, have contributed to a 'gap' between neuroscience and education that has shielded these distortions from scrutiny" (p. 817). Although neuroscience is currently used to argue against learning styles, enthusiasm for neuroscience, combined with a lack of neuroscientific knowledge, leads to tremendous misunderstandings. Most educator preparation programs do not require courses in education neuroscience for certification leaving novice educators susceptible to perpetuating fraudulent neuroscience claims. This misunderstanding and misuse of brain science is similar to the threat posed by multimedia illiteracy that are frequently featured in the news and academia.

An area of possible controversy addressed in the book is that learning styles approach is infused with a powerful yet impractical striving for egalitarianism. The authors advance the idea that the neuromyth is potent because educators want all children to succeed, and the concept of learning styles could be construed as a silver bullet that promises all students will grow and learn. Multiple researchers are cited in the text who support this misinformed opinion. The book enters the realm of science versus sociology and the self-esteem movement. The utilization of a scientific approach to learning styles is set against the anecdotal evidence continually pushed as a rationale for its continued use.

One of the weaknesses in the book becomes more evident in the final chapters as variations of the learning styles myth are connected with multi-modal instructional methodologies supported by research. At one time, the authors argued that connecting learning styles to research-based practices is a

slight-of-hand trick that disguises the practice as an effective method. On the other hand, their investigations found no evidence that the utilization of learning styles negatively affects students. The general conclusion of the authors' argument is that a lack of supporting evidence for learning styles exists as well as a lack of counterevidence. The authors provide numerous statistical models that explain the use of learning styles in research but highlight that no evidence has been found to support matching instruction to student style. However, Chapter 5 illustrates that learning styles must also be critically examined. The researchers continually found that peer-reviewed articles on learning styles primarily supported the theory through correlational data, with no articles recommending that learning styles should be questioned. Therefore, the popularization of the myth is left unquestioned in more general teacher friendly publications.

*Learning Styles, Classroom Instruction, and Student Achievement* fills a gap in the battle against the persistent neuromyth of learning styles. Its editors and contributors provide a clear description of the rise and staying power of the zombie theory of learning styles and its implications for the learning of future generations. Educators tend to be optimistic, and the idea of finding a solution to help all students learn through customized pedagogies is the dream of the differentiation movement. However, the authors shine a spotlight on the lack of corresponding data to support learning styles and the numerous actors who perpetuate the myth and profit from its continued existence.

The text should be highly recommended for future educators, current educators, and parents wanting to understand the conflicting messages about learning styles sent home pertaining to their child's education. Robinson, Yan, and Kim demonstrate that "following the science" is as confusing and paradoxical in education as in virology. Creating a paradigm shift in education based on research instead of myth will depend on understanding falsities of such learning theories, the major trouble with education neuromyths. Toward this aim, the straight-to-the-point style of this volume makes information accessible to experts and general populations of parents and students.

As pointed out by the authors, more research needs to be linked directly to the concept of learning styles and the demonstrable falsities it entails. Peer-reviewed journals need to foster a stricter sense of educational research and what meets the hallmark of quality research. To refute the neuromyth of learning styles, educational researchers and psychologists must provide more robust data contradicting the enmeshing learning styles hypothesis. Educators must realize our role in sustaining the learning styles myth and, as Socrates is reputed to have said, "Know thyself." This book plays a vital role in educators' self-reflections on learning styles and its continued flourishing.

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## About the Reviewer

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